

WHAT IS CLAIMED IS:

1. An analog to digital converter, comprising:

a plurality of comparators, each comparator for
5 comparing an input electrical signal with a respective, pre-
selected reference electrical signal;

an encoder coupled to the comparators to receive a
detection signal from each comparator indicative of the input
signal; and

10 a plurality of reference circuits, each reference
circuit coupled to a respective one of the plurality of
comparators to supply the respective reference electrical
signal to the respective comparator.

15 2. The analog to digital converter of claim 1, wherein each
comparator comprises:

a comparator for comparing a voltage of the input
electrical signal with a voltage of the respective reference
electrical signal, the electrical signal having a pre-
20 selected voltage.

3. The analog to digital converter of claim 2, wherein the
encoder comprises:

an encoder to receive a detection signal from each comparator indicative of an input signal voltage.

4. The analog to digital converter of claim 3, wherein each
5 reference circuit comprises:

an output transistor to provide the reference electrical signal;

a current source coupled between an emitter of the output transistor and ground;

10 a reference resistor coupled to a base of the output transistor to set an operation current of the output transistor;

a control transistor coupled to the reference resistor in parallel with the output transistor to allow current flow
15 through the reference resistor; and

a current mirror coupled in parallel with the reference resistor and control transistor to control the current flowing through the reference resistor.

20 5. The analog to digital converter of claim 4, wherein the current mirror comprises:

a resistor coupled in series with a transistor.

6. The analog to digital converter of claim 3, wherein each reference circuit comprises:

an emitter follower circuit.

5 7. The analog to digital converter of claim 4, wherein the current mirror comprises:

a trans-admittance amplifier coupled in series with a transistor.

10 8. The analog to digital converter of claim 3, wherein each reference circuit comprises:

an output transistor to provide the reference electrical signal;

15 a current source coupled between an emitter of the output transistor and ground;

a reference resistor coupled to a base of the output transistor to set an operation current of the output transistor;

20 a control transistor coupled to the reference resistor in parallel with the output transistor to allow current flow through the reference resistor; and

a trans-admittance amplifier coupled to the base of the control transistor to control the current flowing through the reference resistor.

9. A method for digitizing an analog signal, comprising:

generating a plurality of predetermined reference
electrical signals;

5 supplying each reference electrical signal to a
respective one of a plurality of comparators; and

supplying an input electrical signal to each one of the
comparators to compare the input signal with the respective
reference electrical signal and to provide a detection signal

10 indicative of the input electrical signal.

10. The method of claim 9, wherein generating the plurality
of predetermined reference electrical signals comprises:

generating each reference electrical signal at a
15 preselected voltage.

11. The method of claim 10, wherein supplying the input
electrical signal to each one of the comparators comprises:

supplying the input electrical signal to each one of the
20 comparators to provide a detection signal indicative of an
input signal voltage.

12. The method of claim 11, wherein generating each
predetermined reference electrical signal comprises:

applying a supply voltage to each of a plurality of emitter follower circuits to generate each predetermined reference electrical signal at the respective preselected voltage.

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13. The method of claim 12, wherein generating each predetermined reference electrical signal comprises:

applying a supply voltage to each of a plurality of reference circuits, each reference circuit comprising an
10 output transistor to provide the reference electrical signal, a current source coupled between an emitter of the output transistor and ground, a reference resistor coupled to the a of the output transistor to set an operation current of the output transistor, a control transistor coupled to the
15 reference resistor in parallel with the output transistor to allow current flow through the reference resistor, and a current mirror coupled in parallel with the reference resistor and control transistor to control the current through the reference resistor, the current mirror comprising
20 a trans-admittance amplifier coupled in series with a transistor; and

applying a preselected control current to the trans-admittance amplifier to control the current flowing through the reference resistor to cause the output transistor to

provide the reference electrical signal at the respective preselected voltage.

14. The method of claim 12, wherein generating each
5 predetermined reference electrical signal comprises:

applying a supply voltage to each of a plurality of reference circuits, each reference circuit comprising an output transistor to provide the reference electrical signal, a current source coupled between an emitter of the output
10 transistor and ground, a reference resistor coupled to a base of the output transistor to set an operation current of the output transistor, a control transistor coupled to the reference resistor in parallel with the output transistor to allow current flow through the reference resistor, and a
15 trans-admittance amplifier coupled to the base of the control transistor to control the current through the reference resistor; and

applying a preselected control current to the trans-admittance amplifier to control the current flowing through
20 the reference resistor to cause the output transistor to provide the reference electrical signal at the respective preselected voltage.